

*Peterson 18**Serial No. 09/915,963***Claims Listing**

1 1. (Currently amended) An antenna structure comprising:
2
3 at least one antenna element, the at least one antenna element having at least one
4 taper; and
5
6 a symmetrical finite ground plane coupled with the at least one antenna element;
7
8 wherein the at least one antenna element comprises a traveling wave antenna
9 supporting a phase velocity greater than the speed of light.

1 2. (Canceled) The antenna structure of Claim 1, wherein the at least one antenna
2 element comprises a travelling wave antenna supporting a phase velocity greater than the
3 speed of light.

1 3. (Original) The antenna structure of Claim 1, wherein the taper comprises a linear
2 profile, a linear constant profile, a broken-linear profile, an exponential profile, an
3 exponential constant profile, a tangential profile, a step-constant profile, or a parabolic
4 profile.

1 4. (Original) The antenna structure of Claim 1, wherein the antenna structure
2 supports a cigar-like directional three-dimensional beam pattern and a butterfly wing-like
3 directional three-dimensional beam pattern.

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1 **5.** (Original) The antenna structure of Claim 1, wherein the at least one antenna
2 element is positioned at an angle from the symmetrical ground plane.

1 **6.** (Previously presented) The antenna structure of Claim 5, wherein the angle is
2 about 90 degrees with respect to the x-, y- and z- axes.

1 **7.** (Original) The antenna structure of Claim 1, wherein the at least one antenna
2 element is coupled with the symmetrical ground plane by means of an unbalanced
3 impedance.

1 **8.** (Original) The antenna structure of Claim 7, wherein the unbalanced impedance
2 comprises a coaxial cable.

1 **9.** (Original) The antenna structure of Claim 7, wherein a first conductor of the
2 unbalanced impedance mechanically couples the at least one antenna element with the
3 symmetrical ground plane.

1 **10.** (Original) The antenna structure of Claim 1, wherein the symmetrical ground
2 plane is disk shaped.

1 **11.** (Currently Amended) An antenna structure comprising:
2
3 an array of at least two antenna elements, each antenna element having at least
4 one taper;

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6 a symmetrical finite ground plane; and

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8 an unbalanced impedance for coupling the array of at least two antenna elements
9 with the symmetrical ground plane;

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11 wherein at least one antenna element of the array comprises a traveling wave
12 antenna supporting a phase velocity greater than the speed of light.

1 12. (Canceled) The antenna structure of Claim 11, wherein at least one antenna
2 element of the array comprises a travelling wave antenna supporting a phase velocity
3 greater than the speed of light.

1 13. (Original) The antenna structure of Claim 11, wherein the taper of at least one
2 antenna element of the array comprises a linear profile, a linear constant profile, a broken-
3 linear profile, an exponential profile, an exponential constant profile, a tangential profile,
4 a step-constant profile, or a parabolic profile.

1 14. (Original) The antenna structure of Claim 11, wherein each antenna element of the
2 array supports a cigar-like directional three-dimensional beam pattern and a butterfly
3 wing-like directional three- dimensional beam pattern.

1 15. (Original) The antenna structure of Claim 11, wherein each antenna element of the
2 array is positioned at an angle from the symmetrical ground plane.

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1 16. (Previously presented) The antenna structure of Claim 15, wherein the angle for
2 each antenna element is about 90 degrees with respect to the x-, y- and z- axes.

1 17. (Original) The antenna structure of Claim 11, wherein the unbalanced impedance
2 comprises a coaxial cable.

1 18. (Original) The antenna structure of Claim 17, wherein a first conductor of the
2 unbalanced impedance mechanically couples each antenna element of the array with the
3 symmetrical ground plane.

1 19. (Original) The antenna structure of Claim 11, wherein the symmetrical ground
2 plane is disk shaped.

1 20. (Original) The antenna structure of Claim 11, further comprising a slow wave
2 antenna to widen the directivity of the antenna structure.

1 21. (Currently Amended) An apparatus comprising:
2

3 a transceiver; and
4

5 an antenna structure for radiating or capturing electromagnetic energy from or to
6 the transceiver comprising:
7

8 at least one antenna element having at least one taper, the taper comprising
9 a linear profile, a linear constant profile, a broken-linear profile, an

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10 exponential profile, an exponential constant profile, a tangential profile, a
11 step-constant profile, or a parabolic profile;

12
13 a symmetrical disk shaped finite ground plane, the at least one antenna
14 element being positioned at an angle from the symmetrical disk shaped
15 finite ground plane; and

16
17 an unbalanced impedance for coupling the at least one antenna element
18 with the symmetrical disk shaped finite ground plane;

19
20 wherein the at least one antenna element comprises a traveling wave
21 antenna supporting a phase velocity greater than the speed of light.

1 22. (Original) The apparatus of Claim 21, wherein the at least one antenna element
2 supports a cigar-like directional three-dimensional beam pattern and a butterfly wing-like
3 directional three- dimensional beam pattern.

1 23. (Previously presented) The antenna structure of Claim 21, wherein the angle is
2 about 90 degrees with respect to the x-, y- and z- axes.

1 24. (Original) The antenna structure of Claim 21, wherein the unbalanced impedance
2 comprises a coaxial cable.

1 25. (Original) The antenna structure of Claim 21, wherein a first conductor of the
2 unbalanced impedance mechanically couples the at least one antenna element with the
3 symmetrical ground plane.